GNANAMANI COLLEGE OF TECHNOLOGY

DEPARTMENT:BIO MEDICAL ENGINEERING

YEAR: Third Year

TOPIC: ENVIRONMENTAL MONITORING

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By,

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PROBLEM:

Let's consider a common environmental monitoring problem:

Monitoring soil moistures in a garden to optimize irrigation and conserve water resources.

SOLUTION USING IOT AND ARDUINO:

COMPONENTS NEEDED:

1.ARDUINO BOARD:

You can use an Arduino Uno or Arduino Nano for this project.

2.SOIL MOISTURE SENSOR:

A soil moisture sensor to measure the moisture level in the soil.

3.WIFI MODULE:

An IOT Wi-Fi module like a ESP8266 or ESP32 for internet connectivity.

4.POWER SOURCE:

A power source for your Arduino and Wi-Fi module (e.g. Batteries or a power adapter).

5.BREAD BOARD AND JUMPER WIRES:

To connect and prototype the circuit.

6.CLOUD PLATFORM:

Choose an IOT cloud platform AWD IOT,google cloud IOT or adafruit.

SOLUTION STEPS:

1.CONNECT THE HARDWARE:

* Connect the soil moisture sensor to the Arduino board.

* Connect the wifi module to the Arduino for internet connectivity.

2.CODE THE ARDUINO:

* Write Arduino code to read data from the soil moisture sensor.

* Use the Wi-Fi module to send this data to your choose IOT cloud platform.

3.SET UP CLOUD PLATFORM:

* Create an account on your choose IOT cloud platform.

* Set up a device and topic for your Arduino to publish data to.

4.PUBLISH DATA:

* Modify your Arduino code to publish soil moisture data to the cloud platform at regular intervals(e.g. Every 15 minutes).

5.DATA STORAGE AND VISUALIZATION:

* Use the cloud platform services to store and visualize the data.

* Create graphs or dashboards to monitor soil moisture levels remotely.

6.THRESHOLD AND ALERTS:

* Define moisture level threshold for your specific plants.

* Set up alerts or notifications throw the cloud platform when moisture levels fall below or exceed these thresholds.

* With this IOT and Arduino solution, you can monitor soil moisture levels *remotely, enabling you to optimize irrigation and prevent under watering.*

* It conserves water resources by ensuring that plants receive the right amount of water.

* Alerts and notifications help you take timely action when moisture levels or not with in the desired range.

* The data collector over time can also provide insides into plant health and watering patterns, helping you make informed decisions.

USES:

Environmental monitoring often involves the use of strategically placed data collection points to gather information about various environmental factors such as air quality, water quality, temperature and more.

* These points can be sensors or monitoring stations that help assess the state of the environment and track changes over time.

ADVANTAGES:

Resource Management:

***** Helps in the sustainable management of natural resources like water, air, soil, ensuring their preservation for future generations.

Public Health Protection:

* Monitoring can identify threats to public health, such as air quality issues or contaminated water sources, allowing for interventions.

DISADVANTAGE:

Environment Impact:

The monitoring process itself can have environmental consequences.

Data Management:

Storing, managing, and analyzing large volumes of data can be challenging.